APPENDIX B: DESIGN SUBMITTALS AND DOCUMENTATION

B.1 Block Plan Submittal (S-1). Block Plans shall include at least three substantially different alternative design solutions. The intent is to either select one of the three schemes or develop a composite scheme for room-by-room floor plan development in S4. Each block plan will show building massing, siting, and the layout of the gross function areas (blocks) within the building. Although not normally required, DMFO may be included in the review process where size or complexity warrants early participation or DMFO requests to participate. The following are the suggested requirements for the Block Plan effort:

B.1.1 Site plans of each scheme showing existing and proposed structures, topography, utilities, roads, and parking.

B.1.2 Floor plans for each scheme showing each level with circulation patterns and principal dimensions. On addition/alteration projects, existing versus new conditions must be clearly delineated.

B.1.3 Gross area tabulation of floor area, along with small scale, single-line, dimensioned drawings, to reflect the total space required in Figure 2-7 format.

B.1.4 Preliminary cost estimate for each scheme.

B.1.5 Narrative description of each scheme and scheme comparisons explaining strong and weak points of each solution and the rationale for the recommended solution. The following features must be addressed for each scheme: expandability, flexibility, proposed structural system, proposed mechanical system(s), electrical system, energy conservation features, net-to-gross ratio, phasing, and initial constructability considerations.

B.1.6 Site investigation report will address the existing and proposed conditions on and near the site including: demolition requirements (if any), topography, adjacent facilities, site vegetation, access roads, easements, safety clearances, site acoustics, parking (existing and proposed), soil conditions, floodplains or wetlands criteria, asbestos and hazardous waste on-site, and energy considerations such as building orientation, solar access, and prevailing wind conditions. Provide a summary of any environmental impact studies, base master plans and base architectural plans where available. Provide photographs of the site and nearby structures.

B.1.7 Site utilities report will address: storm drainage, sewer, water (potable and fire protection), gas, central heating and cooling, electricity, telephone, fire alarm, and communications. Address the quality and capacity of the existing utilities to serve the proposed project and any demolition required.

B.1.8 Economic Analyses (EA) of new versus addition/alteration where requested by DMFO, or update(substantiation) previous EA.

B.1.9 Pencil sketch perspectives for each proposed solution.

B.1.10 A massing model of each solution, particularly addition/alteration projects where "new" and "addition" versus existing

must be clearly defined.

B.1.11 Updating or verification of as-built and/or as-utilized drawings in addition-alteration projects may be required as directed by the Design Agent.

B.1.12 The narrative portion of the submittal, calculations, cost estimate, and reports shall be on 8-1/2 x 11 inch sheets packaged in a standard U.S. 3-ring binder with labeled subject dividers, sequential page numbers, and table of contents.

B.2 Schematic Design Submittal (S-2). This submittal includes development of the room-by-room floor plans, elevations, and initial analysis of the major architectural and engineering systems based on the selected (or composite) block plan from S-1. The primary purpose of this submittal and review is to identify and resolve all major space program deficiencies at an early stage in design, develop the massing and aesthetics of the facility, and "fix" the scope of the building. The Design Agent, using Military department representatives, and A-E, if required, will present the reviewed S-2 to DMFO. Requests for scope revisions with justification should be submitted at this time. Scope changes will not be entertained after approval of S-2 unless fully justified. DMFO will provide approval/disapproval, with review comments, within 14 days of the presentation. The following are the minimum DMFO requirements for S-2:

B.2.1 Executive Summary of the following:

- various Block Plan alternatives from S-1, and rationale for the selected scheme. The primary block plan drawings from S-1 shall be included as double-page, fold-out, reduced drawings.

- summary of the narrative describing various proposed architectural and engineering aspects of the projects.

B.2.2 Site plans showing building location, future expansion, and existing and proposed structures, topography, utilities, roads and parking.

B.2.3 Floor plans for each floor showing all programmed spaces, corridors, structural grid system (including columns), electrical and mechanical equipment rooms, and stairs/elevators/escalators to meet the functional requirements. All spaces must be labeled with the room name, the room code from the DMFO Program For Design (PFD), and the programmed and designed net areas. For addition/alteration projects, preliminary demolition drawings, with photographs to depict conditions are required.

B.2.4 Plans showing major circulation paths in and around the facility, for significant projects, only.

B.2.5 A separate plan of the blast hardened/CBR protected area, if programmed, showing how the spaces would be utilized during contingency operations.

B.2.6 Exterior elevations and major building sections appropriate to the level of Concept Design development. To assure Post or Base compatibility, observe and document the physical features of the site and

the character/style of any surrounding building(s).

B.2.7 Refined massing model, from S-1, as required.

B.2.8 A comprehensive narrative describing various proposed architectural and engineering aspects of the projects as follows:

B.2.8.1 Civil Design Narrative. Include site investigation and utilities reports based on further refinement of the S-1 requirements;

B.2.8.2 Architectural Design Narrative. Address the overall architectural concept including: Exterior wall systems and finish materials being considered, (develop alternative exterior materials and wall assemblies, compare each exterior wall scheme by both qualitative and quantitative analysis and include energy-conscious design considerations; prepare dew point calculations following recommended design procedures in the ASHRAE Handbook of Fundamentals; acoustics, base architectural plan, floor-to-floor heights, proposed roofing materials, slope(s), styles, contingency and mobilization features, energy conservation features, life safety, and fire protection features, and Uniform Federal Accessibility Standards (UFAS) compliance;

B.2.8.3 Structural Design Narrative. Alternative Structural Systems. A minimum of three structural systems shall be thoroughly evaluated and submitted with a recommended selection of a structural system based on an economic study. The structural system selected shall be the one which best combines economy and suitability regarding functionality, design systems, space configuration, architectural features and seismic (Section 6) resistance configuration for the specific project. The comparative study shall address the cost of foundations and superstructure as well as appropriate cost factors for architectural, fire protection, mechanical, electrical, and seismic conditions where these vary between structural systems. Some structural systems are more compatible than others with the architectural, horizontal flexibility, fire protection, mechanical, electrical, and seismic requirements for facilities. Structural systems shall be evaluated within this context to determine penalties or advantages of alternate designs. Narrative justification, describing the basis for system selection, along with drawings of the selected structural system adequately developed so that no additional major engineering decisions are required, shall be provided. The economic study shall employ a method which considers all factors and requirements of the system's total life cycle costs. The method employed shall incorporate cost per unit of area, erection time, compatibility with other systems, nonstructural flexibility, lateral load resistance, noise attenuation and the natural vibration period of the structure, when applicable. For facilities two stories or greater located in regions of high or moderate seismic risk, as determined in Section 6, at least one structural system that includes components that provide base isolation or active or passive energy dissipation should be included as a structural system alternative.

B.2.8.4 Seismic Design Narrative. Summarize the seismic design considerations including "I" and "K" values and the level of protection required. Discuss post-earthquake operation requirements;

B.2.8.5 Heating, Ventilation, and Air Conditioning (HVAC) Design Narrative. Discuss design considerations and space requirements for the primary and secondary HVAC systems being considered. Provide a written

description of the anticipated smoke control system, passive or active. If an Engineering Smoke (EMCS) is planned, provide a discussion on economics justification;

B.2.8.6 Plumbing Design Narrative. Discuss design considerations and space requirements for the various plumbing systems, including domestic hot and cold water, fuel gas, medical gases, sanitary waste, acid waste, and storm drains. Discuss water supply, quality, required storage, and distribution systems. Discuss hot water generation, storage, temperatures, and distribution systems. Address various types of medical gases, storage, and distribution systems;

B.2.8.7 Electrical Design Narrative. Discuss design considerations and space requirements for electrical systems. Address the following: voltage, routing, and reliability of primary services; connected and demand load; normal and essential electrical system; emergency power; lighting systems; and energy conservation features;

B.2.8.8 Communication Design Narrative. Discuss design considerations and space requirements for the following: telephone, intercom, dictation, paging, public address, televisions, nurse call, Comprehensive Healthcare [Computer] Systems (CHCS), data communication, and security systems; uninterruptible power supply (UPS);

B.2.8.9 Fire Protection Design Narrative: Address the following: type of construction, fire rating of materials, occupancy classification, fire detection, alarm, and suppression systems. Provide a summary of the latest Fire Safety Evaluation System Study for addition/alteration projects;

B.2.8.10 If IBS is planned for other than medical centers/teaching hospitals, provide an expanded justification;

B.2.8.11 If an Engineered Smoke Control System (ESCS) or an Energy Monitoring and Control System (EMCS) is planned, provide an economic justification; and

B.2.8.12 Construction Phasing Narrative. For addition/ alteration projects, provide a narrative description of the proposed Construction Phasing to evaluate the continued/uninterrupted operation of the existing facility during construction and the associated impact on the construction cost. Identify requirements for temporary buildings to serve as swing space during the construction and the cost associated with these buildings.

B.2.9 Gross area tabulation of floor area, along with a small scale, single-line, dimensioned key plan, to reflect the total space required in Figure 2-5 format.

B.2.10 Net area tabulations, including net to gross calculations, in Figure 2-6 format.

B.2.11 A net-to-gross area conversion summary comparing the as-designed condition with the applicable net-to-gross square feet allowances in Figure 2-8.

B.2.12 Updated cost estimate.

B.2.13 The narrative portion of the S-2 submittal, calculations, and cost estimate shall comply with paragraph B.4.2.

B.3 Design Development Submittal (S-3). This submittal is about 30 percent of the total design effort in all disciplines and includes further development of DMFO-approved S-2 submittal. The purpose of this submittal is to finalize all major design/engineering decisions and to validate project scope and cost. DMFO does not normally review this submittal; however, if the design is developed well enough, it may be submitted to DMFO as the S-4. The following are minimum requirements for this submission:

B.3.1 An update of all requirements in the S-2 Submission.

B.3.2 An Executive Summary (in addition to the other submittal requirements) to include design intent, proposed architectural engineering systems, results of VE study, phasing plans, costs, scope, and a general description of the project. Include sufficient detail to provide an overview of the project. The Executive Summary shall either be bound separately for hospital type projects or shall be included as a separate chapter in the Design Analysis for other medical projects.

B.3.3 Plans showing design in sufficient detail to allow for an in-depth review and a reliable cost estimate. As a minimum, provide the following:

B.3.3.1 Site plans showing building location, future expansion, existing and proposed structures, topography, utilities, roads, parking, and landscaping;

B.3.3.2 Floor plans for each floor showing all programmed spaces, corridors, structural grid system (including columns), electrical/communications/ mechanical equipment rooms, and stairs/elevators/escalators to meet the functional requirements. All spaces must be labeled with the room name, the room code from the DMFO program for design, and the programmed and designed net areas;

B.3.3.3 All exterior elevations and major building sections;

B.3.3.4 Reflected ceiling plans showing ceiling grid and light fixture placement;

B.3.3.5 Equipment plans showing all category A, B, C, D, E, F, and G equipment. Show Category A, B, and E equipment on the equipment drawings and floor plans with solid lines and Category C and F equipment with dashed lines. Provide Joint Schedule Numbers (JSN) as indicated in the Medical Facility Room Contents List (MFRCL) for all applicable logistical categories. The Joint Schedule Numbers (JSN) or the National Stock Numbers (NSN), within the MIL-STD 1691, shall not be used as substitutes for contract specifications and detail drawings. Citing JSN numbers and nomenclatures will not relieve the designer of the responsibility to verify and provide all necessary detail drawings and specifications showing actual dimensions, utility connections, accessories, quantity,

quality, and performance required. Where reference to a specification is included in a JSN item description, items identified as Category "A" in "CAT" column shall be procured against the latest authorized specification or purchase description. Designers shall assure that current specifications and their latest amendments or purchase description shall be used in the procurement of equipment supplied by the Construction Contractor.

B.3.3.6 HVAC plans showing layout of mechanical rooms and one line drawing of distribution systems. Provide schematic diagrams of the major supply, return, and exhaust systems;

B.3.3.7 Plumbing plans showing plumbing, medical air, vacuum, and medical gas equipment and major distribution lines including riser diagrams;

B.3.3.8 Electrical plans showing electrical room layouts, light fixture locations, receptacle locations, motor controls, and locations of panelboards and distribution equipment. Provide single line diagrams of the normal/ essential electrical systems,emergency power, and UPS;

B.3.3.9 Communication plans showing location of communication equipment and devices. Show layout of communication closets and provide single line diagram for each system;

B.3.3.10 Fire protection plans showing sprinklered areas, fire rated walls and doors, smoke compartmentation, fire pumps, stand pipes, fire extinguisher cabinets, fire alarm, and fire exits.

B.3.3.11 For addition/alteration projects, preliminary demolition drawings indicating the removal of structural, architectural, mechanical/electrical/communications systems, asbestos and hazardous materials. Photographs are desirable to accurately communicate existing conditions.

B.3.4 A comprehensive narrative describing various architectural and engineering systems being considered:

B.3.4.1 Civil Design Narrative. Include the site investigation and utilities reports based on further refinement of the S-2 requirements. Summarize the civil design parameters, parking, and the major features of the design;

B.3.4.2 Architectural Design Narrative. Address the overall architectural concept including: interior (in accordance with Appendix A) and exterior finish materials (to include proposed Structural Interior Design (SID) color scheme/selections, see para 4.14), wall systems, roofing systems, acoustics, base architectural plan, floor-to-floor heights, contingency and mobilization features, energy conservation features, life safety, UFAS, and fire protection features;

B.3.4.3 Structural Design Narrative. Address the alternative structural foundation and framing systems considered and provide economic basis for system selection. Address long-span versus other alternatives and concrete versus steel structure. Summarize the structural design parameters and the major features of the design;

B.3.4.4 Seismic Design Narrative. Summarize the seismic design considerations including "I" and "K" values and the level of protection required. Discuss post-earthquake operation requirements. Summarize the structural design parameters and the major features of the design;

B.3.4.5 Heating, Ventilation, and Air Conditioning (HVAC) Design Narrative. Provide a summary of the primary and secondary HVAC systems considered and the economic basis for system selection. Summarize the proposed control systems, fire protection features, and the energy conservation features being considered;

B.3.4.6 Plumbing Design Narrative. Describe the various plumbing systems, including domestic hot and cold water, fuel gas, medical gases, sanitary waste, acid waste, and storm drains. Discuss water supply, quality, required storage, and distribution systems. Discuss hot water generation, storage, temperatures, and distribution systems. Address various types of medical gases, storage, and distribution systems;

B.3.4.7 Electrical Design Narrative. Summarize the electrical design parameters and the major features of the design. Address the following: voltage, routing, and reliability of primary services; connected and demand load; normal /essential/emergency electrical system; lighting systems; and energy conservation features;

B.3.4.8 Communication Design Narrative. Summarize the communication systems design parameters and the major features of the design. Discuss the following: telephone, intercom, dictation, paging, public address, television, nurse call, CHCS, data communication, and security systems;

B.3.4.9 Fire Protection Design Narrative: Summarize the fire protection systems design parameters and the major features of the design. Address the following: type of construction, fire rating of materials, occupancy classification, fire detection, alarm, and suppression systems. Provide a summary of the latest Fire Safety Evaluation System Study for addition/alteration projects;

B.3.4.10 Integrated Building System (IBS) Narrative. If IBS was approved at S-2, provide a summary of the IBS design parameters and the major features of the design;

B.3.4.11 Engineered Smoke Control System (ESCS) narrative. If an ESCS or an Energy Monitoring and Control System (EMCS) was approved at S-2, provide a summary of the ESCS/EMCS design parameters and the major features of the design;

B.3.4.12 Energy Conscious Design Narrative. Discuss all energy conscious design considerations implemented and considered for the design. Address all design disciplines that affect energy consumption. In addition, address the following: siting, orientation, solar access, and climatic influences; conservation (systems selection, etc.); renewable energy features (passive solar/daylighting, active solar, etc.); energy budget compliance; energy conscious design summary and other important energy design issues. The feasibility of total or selective energy systems shall be evaluated;

B.3.4.13 Food Service Narrative (when applicable). Summarize the food service systems design parameters and the major features of the design.

Discuss the various systems considered and the economic basis for the system selections;

B.3.4.14 Materials Handling and Transportation Systems Narrative (when applicable). Summarize the materials handling and transportation systems design parameters and the major features of the design. Include escalators, elevators, cart lifts, automatic box conveyor systems, dumb-waiters, linen and trash chutes, pneumatic tubes, etc. The study is to include equipment requirements life-cycle-costs, maintenance, appearance, ease of operation, noise, security, maintainability, and availability in a competitive marketplace for each system;

B.3.4.15 Waste Handling Systems Narrative. Summarize the waste handling systems design parameters and the major features of the design. Address trash removal; hazardous, infectious, and biological waste; retort sterilizers; incinerators; and other waste handling features of the design; and

B.3.4.16 Security Systems Narrative. Summarize the security systems design parameters and the major features of the design.

B.3.5 Detailed Cost Estimate.

B.3.6 An updated DD Form 1391 reflecting the reviewed cost estimate, any changes to the project description, and justification.

B.3.7 Gross area tabulation of floor area, along with small scale, single-line, dimensioned drawings, to reflect the total space required in Figure 2-5 format.

B.3.8 Updated net area tabulations, including net to gross calculations, in the format of Figure 2-6.

B.3.9 Outline specifications showing basic intent.

B.3.11 Room finishes schedule keyed to the plans by room number and name. Provide color boards with samples of major finishes.

B.3.12 Equipment list showing all category A, B, C, D, E, F and G equipment for each room keyed to the plans by room number and name. Provide equipment data sheets for all equipment that requires utility connections. The AE must develop the initial official project MFRCL into a viable room-by-room listing. Coordinate substitutions or changes with the using Military Department. The type, quantity, and location of biological, radioisotope, fume, canopy, and laminar air hoods shall also be indicated in the equipment list. Provide an appropriate catalog cut sheet(s) for all items of equipment having a logistical category code of A, B, E, or F and any C and G items having unique utility requirements, structural support, or space requirements.

B.3.13 A pencil sketch perspective drawing depicting the proposed structure. This sketch will be critically reviewed as the basis for the subsequent rendering requirement. This requirement does not apply to projects which are primarily life safety code upgrade and minor additions.

B.3.14 Finalized model (if required by the Design Agent) , showing the site, site circulation, parking, massing of structure, and a delineation

between new and existing if the project contains additions and/or alteration.

B.3.15 The narrative portion of the submittal, calculations, and cost estimate shall be packaged in standard U.S. 3-ring binders with labeled subject dividers, sequential page numbers, and table of contents.

B.3.16 Value Engineering Study (VE). Conduct Value Engineering (VE) study during design following the S-3 submission in accordance with DoD Directive 4245.8. Value Engineering Studies consist of investigations of certain high-cost areas in a design to determine if an alternate way exists to achieve an improved design at a lower life-cycle-cost. The main objectives of VE studies are reduced life-cycle-cost and improved quality of design. The application of Value Engineering shall not result in lowering criteria or quality standards as established by the guidance in this document or reduction in the scope of the project.

B.4 35 Percent Design Submittal (S-4). This submittal is as a minimum 35 percent of the total design effort in all disciplines and includes a corrected and refined S-3 package based on the S-3 review. The reviewed S-4 will be submitted to DMFO by the Design Agent and the using Military Department. A-E participation may be required on large or complex projects. Final scope and PA (cost) shall be determined with this submission. The minimum requirements of this submission are the same as described for S-3 and a copy of the VE Study.

B.4.1 This is considered the "technical submission" and all issues regarding costs, Value Engineering Study (VE), constructability, phasing, and any other special studies must be resolved, though the results of all studies may not be incorporated prior to presenting this submission to DMFO for approval. Action taken on Value Engineering proposals must be included with this submission.

B.4.2 The narrative portion of the submittal, calculations, and cost estimate shall be packaged in standard U.S. 3-ring binders with labeled subject dividers, sequential page numbers, and table of contents. Drawings shall be at a minimum 1:100 SI (1/8 inch scale); however 1:50 SI (1/4 inch) scale may be necessary for clarity on equipment plans, mechanical and electrical equipment room layouts, complex rooms or departments, interior elevations. Full-size or half-size drawings will be provided as stipulated in the distribution schedule.

B.4.3 Rendering. A final rendering is prepared after 35 Percent Design Submission approval. A color photograph of the original rendering, aproximately 5OO mm X 400 mm (20 x 16 inch) in a 700 mm X 500 mm (28 x 20 inch) brushed aluminum frame shall be sent to DMFO. The photograph is to reflect the 35 percent review comments and be titled, matted, framed, and glazed with nonglare tempered glass or plexiglas. Other photographs are to be distributed as scheduled by the Design Agent in coordination with the using Military Department at the prenegotiation conference.

B.5 Final Design (35 percent to 100 percent). The final design phase may be initiated only after approval of Concept Design by the DMFO. If, in the preparation of Contract Documents (CD's), it is necessary to deviate substantially from the approved Concept Design, such as the rearrangement of a major medical department or a change in the

interrelationship of functional elements, design may be suspended and the pertinent facts and justifications concerning the deviations will be submitted for review and approval by DMFO.

B.5.1 Contract Documents (CD's). Final working drawings shall be prepared only to the scale necessary for clarity, good bidding, and ease of constructability. Where dictated by complexity, CD's shall be drawn to 1/4-inch to the foot. To reduce the sheer volume of production drawings, those areas and disciplines not requiring 1/4 scale drawings for bidding shall be prepared at 1/8 scale.

B.5.2 Comprehensive Interior Design (CID). The final design phase, at option of using Military Department, may include a Comprehensive Interior Design (CID) effort for furniture and accessory selection, layout and identification, and documentation for procurement. The Comprehensive Interior Design (CID) package is to be coordinated with the interior finishes and colors Structural Interior Design (SID) early in the final design phase so that the first submittal of the CID will be fully coordinated with the building design at S-5. Subsequent selections of furnishings and medical equipment are to be coordinated with the CID. See Glossary, para 4.14, and para 4.17 for expanded definitions of CID and SID.

B.5.3 65 Percent Submittal (S-5). On a case-by-case basis, DMFO may request submission of 65 Percent Preliminary Working Drawings. The Design Agent, with the participation of the using Military Service, may develop the specific submittal requirements to define the S5 level of design effort.

B.5.3.1 Comprehensive Fire Protection Design. All fire protection provisions shall be summarized and submitted as a separate plan supported by a fire protection design analysis, including fire protection drawings developed during the Concept phase of the design. The fire protection study shall include related design considerations and criteria that have been coordinated among all the affected disciplines and shall serve as the basis for the design, construction, and future operation of the building. If required by the Design Agent, a completed Statement of Construction will be provided at the completion of construction by the contractor.

B.5.3.2 Equipment Specifications. The AE shall develop specifications for all equipment that does not have current guide specifications. Update the specifications to permit procurement of the latest model of equipment. Develop the specifications to accommodate at least three reputable vendors of the same type equipment when practicable. Coordinate problem items with the using Military Department. Include the scope of services to be provided by mechanical and electrical contractors for installing government furnished equipment. The Joint Schedule Numbers (JSN) or the National Stock Numbers (NSN), within the MIL-STD 1691, shall not be used as substitutes for contract specifications and detail drawings. Citing JSN numbers and nomenclatures will not relieve the designer of the responsibility to verify and provide all necessary detail drawings and specifications showing actual dimensions, utility connections, accessories, quantity, quality, and performance required. Where reference to a specification is included in a JSN item description, items identified as Category "A" in "CAT" column shall be procured against the latest authorized specification or purchase description. Designers shall assure that current specifications and their latest amendments or purchase

description shall be used in the procurement of equipment supplied by the Construction Contractor.

B.5.4 100 Percent/Final Submittal (S-6). When the design is complete, the Design Agent will submit a copy of the final documents (i.e. drawings, specification, cost estimate, instructions to bidders, etc.) to DMFO. Along with this package, the Design Agent shall provide a memorandum to DMFO certifying that the design has been completed and that all technical requirements and cost criteria approved at the 35 Percent Design stage have been incorporated into the Final Design.